

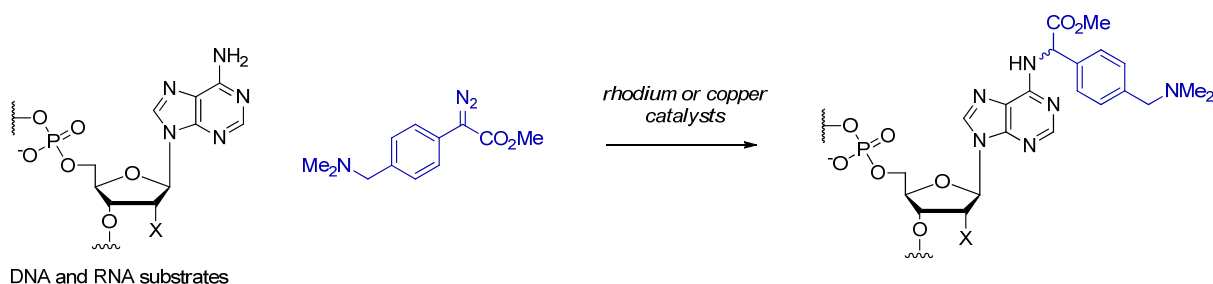
Catalytic Alkylation of Nucleic Acids

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Understanding and controlling the biology of nucleic acids is partially a challenge in synthetic chemistry: How to precisely manipulate a single subunit in an ocean of near-identical units. Addressing this challenge in chemo- and site-selectivity is vital since tinkering with a molecule's structure is one of the best ways to learn how it works.¹ We have been developing organometallic catalysts for the site- and structure-specific targeting of DNA and RNA.² In particular, rhodium and copper complexes³ in conjunction with α -diazocarbonyl compounds lead to N-H insertion reactions with the exocyclic amine groups in single-stranded regions of DNA and RNA. I will outline our efforts in identifying organometallic complexes that target nucleic acids and in developing ligand systems for these complexes that steer substrate selection.



1. Dennis Gillingham; Kiril Tishinov "Synthesis of Nucleic Acid Polymers with Non-Canonical Nucleobases" *Synlett*, **2013**, DOI: 10.1055/s-0032-1318493 (invited article).
2. Kiril Tishinov, Kristina Schmidt, Daniel Häusinger, Dennis Gillingham "Structure-Selective Catalytic Alkylation of DNA and RNA" *Angew. Chem. Int. Ed.* **2012**, *51*, 12000-12004.
3. Kiril Tishinov, Na Fei, Dennis Gillingham "Simultaneous Cu(I)-catalysis of an azide-alkyne cycloaddition and an N-H insertion in water" *Submitted for Publication*